204 Evolution of glucose intolerance in adolescent CF patients

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As life expectancy for CF patients has improved, other complications such as CF-related diabetes (CFRD) have been increasingly recognized. One would expect that as disease progresses, a continuum of glucose intolerance ranging from normal glucose tolerance (NGT) to impaired glucose tolerance (IGT) to CFRD would occur however the natural history of glucose intolerance in CF is not clear.
Objective: We performed a retrospective analysis of the long-term natural history of glucose homeostasis in an adolescent CF population. These patients were initially evaluated prospectively by modified oral glucose tolerance testing (OGTT) at our clinic (J Pediatr 2003;142:128–32).
Methods: Using the Toronto CF database we reviewed all of the 94 CF patients' modified OGTT results since the time of initial testing in 1998 and categorized them into the following classification: NGT, IGT, CFRD without fasting hyperglycemia (FH) and CFRD with FH.
Results: Out of the 94 patients initially studied 70 underwent subsequent OGTT testing. The median age was 12 years (9–18 years), all were pancreatic insufficient. Median follow-up was 5 years. Overall 271 OGTTs were performed.
Conclusion: The evolution of glucose intolerance is highly variable in adolescent/young adult CF patients. We found that 50% (8/16) patients detected to have IGT converted back to NGT on subsequent testing. Glucose intolerance in CF patients does not necessarily follow a continuum of NGT to IGT to CFRD as may be expected. Regular follow-up testing is important.

Results of OGTT

	Initial test	1st subsequent test			
		NGT	IGT	CFRD without FH	CFRD with FH
NGT	74	37	13	0	0
IGT	16	8	2	3	4
CFRD without FH	4	0	0	3	0
CFRD with FH	0	0	0	0	0

205 Microalbuminuria in patients with cystic fibrosis: diabetic or cystic fibrosis-related?

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In patients with cystic fibrosis-related diabetes (CFRD) microalbuminuria (MA) is more common than in type 1 diabetes mellitus. In this study we investigate whether the prevalence of MA is attributable to the fact that patients have cystic fibrosis (CF), rather than CFRD.
Study design: Cross-sectional case control study.
Subjects: The patient groups consisted of 146 adults with CF. 57 healthy adults served as controls.
Methods: All CF patients with exocrine pancreatic insufficiency had a modified oral glucose tolerance test to determine their diabetic status. A sample morning midstream urine of each subject was analyzed for albumin-creatinine ratio (ACR). MA was defined as ACR above 2.5 for men and above 3.5 for women.
Results: Of the CF patients, 49 had CFRD, 25 had impaired glucose tolerance and 72 subjects had no signs of diabetes. Of all CFRD patients, 8 had MA (16.3%), which was higher than in non-diabetic CF patients ($p = 0.001$) and healthy controls ($p = 0.002$). Between the two latter groups there was no significant difference in the prevalence of MA. In women with CFRD, MA tended to be more frequent than in men with CFRD ($p = 0.08$).
CFRD patients had a significant higher median ACR compared to both non-diabetic patients ($p = 0.02$) and healthy controls ($p = 0.04$). Median ACR's were similar in the non-diabetic CF group and the healthy controls, as were the creatinine levels.
Conclusion This study shows that CFRD patients have MA more often than non-diabetic CF patients or healthy controls, in whom it is observed rarely. In contrast to previous reports, our data suggest that the diabetic state rather than CF as a disease appears to contribute to MA.

206 Incidence of nephrocalcinosis and hypercalciuria in Turkish cystic fibrosis children

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Patients with cystic fibrosis (CF) have an increased incidence of nephrolithiasis. Because CF epithelia have ion transport abnormalities that may in part be regulated by intracelluler calcium metabolism, and the kidney is actively involved in both transport and calcium homeostasis, nephrocalcinosis in infants with CF probably is evidence.
Aims: This study was to determine the frequency of hypercalciuria, and nephrocalcinosis in CF patients.
Results: Seventy-four CF children (37 boys, 37 girls, mean age 83.7 months, range 3 months-24 years) were included in this study. Twenty-four hours urine collection were analyzed in 42 CF patients and spot urine were analyzed in 32 CF patients. Renal ultrasound (RU) studies were performed in all patients. Plasma electrolytes, calcium, magnesium, phosphorus, and serum 25-hydroxyvitamine-D levels were measured in all patients. Urine samples were examined for microscopic hematuria and were detected in 8 CF patients. In 63 of the 74 CF patients urinary calcium excreation was normal (less than 4 mg/kg/h), 11 CF patients had hypercalciuria (calcium excretion 4.8 to 5.2 mg/kg/h). In 5 (RU) findings were abnormal. Focal calcinosis, pelvicalicial dilatation, hyperechogenity were detected in one, one and three patients, respectively. Patient who had focal calcinosis in (RU) was one year old. There was no correlation between 25 hyroxyvitamine-D levels and hypercalciuria. The incidence of nephrolithiasis in our study was 1.3% and hypercalciuria was 14.86%.
Conclusion: In this study; the incidence of nephrocalcinosis in CF patients was not found higher than normal population, different from other studies.

207* Essential fatty acid (EFA) profile in CF patients with 'severe' and 'mild' mutations

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In CF patients the EFA profile is abnormal, and this is especially prominent in patients with specific 'severe' mutations (Strandvik 2001). The abnormal EFA profile is so striking that it has been suggested to use it as an ancillary test to support the diagnosis of CF (Batal 2007). However, limited data are available about EFA profile in CF patients with 'mild' mutations. Therefore a study involving EFA chromatogram and concentration acquisition in 229 Belgian CF patients and 100 age matched controls has been designed. A GC-MS analytical method has been selected both for its high sensitivity and specificity, using a 30 m × 0.25 µm ID column after transesterification with acetyl chloride to quantitatively analyse 28 fatty acids ranging from C12-C24. We report an interim analysis on 83 patients (33F-50M; age range 1–55 years). Patients were classified in three groups: F508del homozygous ($n = 46$), other class 1–3 mutations ($n = 18$), at least one class 4–5 mutation ($n = 19$). Fatty acid values are expressed as molar percent; means (SEM) are reported.
Linoleic acid and DHA values were not dependent on age, sex nor serum cholesterol concentration but significantly correlated with mutation class ($P < 0.001$). As previously reported, deficiency in linoleic acid and DHA is more striking in patients with severe mutations. In patients with mild mutations the product linoleic acid x DHA is still well below values reported in healthy controls. Therefore the value of EFA profile as an ancillary test for CF diagnosis will be further explored.

	F508del/F508del	Other class 1–3	One class 4–5	P group 1 vs 3
Linoleic acid	20.4 (0.6)	22.8 (1.1)	25.8 (0.6)	<0.0001
DHA	1.17 (0.06)	1.26 (0.12)	1.37 (0.09)	0.08
Linoleic x DHA	24.2 (1.4)	29.0 (3.0)	35.5 (2.5)	<0.001